

## Geometry 1.7 Study Guide: Transformations in the Coordinate Plane (pp 50-52)

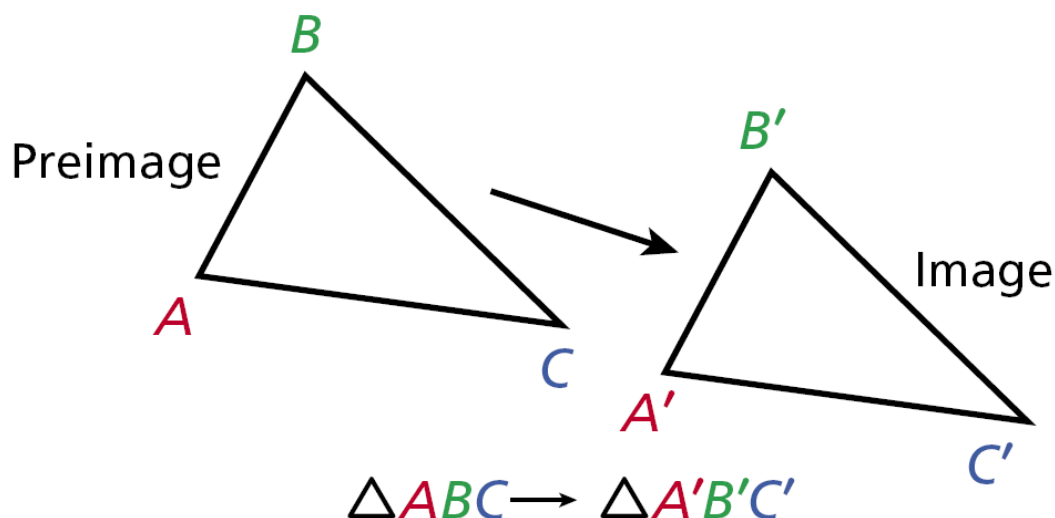
- I can identify reflections, rotations, and translations.
- I can graph transformations in the coordinate plane.

### Common Core

- **CC.9-12.G.CO.4** Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
- **CC.9-12.G.CO.2** Represent transformations in the plane using.
- **CC.9-12.G.CO.5** Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure...Specify a sequence of transformations that will carry a given figure onto another.

The Alhambra, a 13th-century palace in Grenada, Spain, is famous for the geometric patterns that cover its walls and floors. To create a variety of designs, the builders based the patterns on several different *transformations*.

1. What is a transformation?
2. In a transformation, what is the original image called?
3. In a transformation, what is the new image called?
4. What is the notation used to show a transformation?
5. How do you label the point of the transformed image?



### Transformations

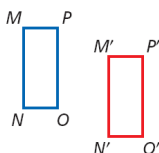
REFLECTION	ROTATION	TRANSLATION
<p>A <b>reflection</b> (or <i>flip</i>) is a transformation across a line, called the line of reflection. Each point and its image are the same distance from the line of reflection.</p>	<p>A <b>rotation</b> (or <i>turn</i>) is a transformation about a point <math>P</math>, called the center of rotation. Each point and its image are the same distance from <math>P</math>.</p>	<p>A <b>translation</b> (or <i>slide</i>) is a transformation in which all the points of a figure move the same distance in the same direction.</p>

Refer to example 1 on pages 50 and 51.

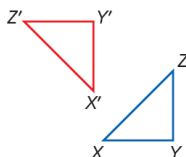


**Guided Practice:** Identify each transformation. Then use arrow notation to describe the transformation.

6.

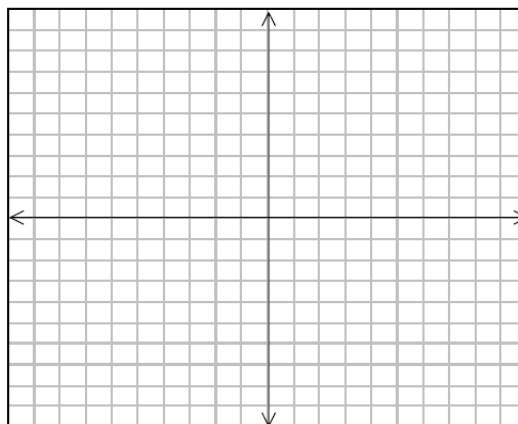


7.



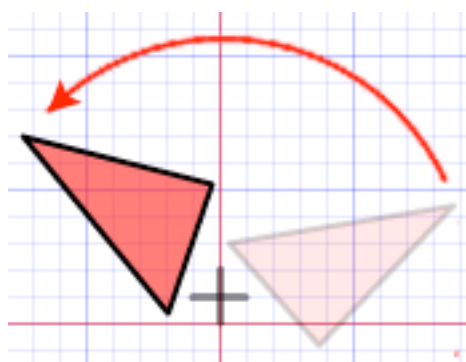
Refer to example 2 on page 51.

**8. Guided Practice:** A figure has vertices at  $E(2, 0)$ ,  $F(2, -1)$ ,  $G(5, -1)$ , and  $H(5, 0)$ . After a transformation, the image of the figure has vertices at  $E'(0, 2)$ ,  $F'(1, 2)$ ,  $G'(1, 5)$ , and  $H(0, 5)$ . Draw the preimage and image. Then identify the transformation.



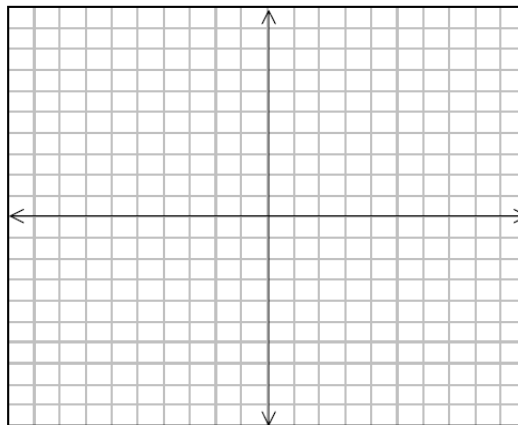
To find coordinates for the image of a figure in a **translation**, add  $a$  to the  $x$ -coordinates of the preimage and add  $b$  to the  $y$ -coordinates of the preimage. Translations can also be described by a rule such as  $(x, y) \rightarrow (x + a, y + b)$ .

Refer to example 3 on pages 51-52.



## Geometry 1.7 Study Guide: Transformations in the Coordinate Plane (pp 50-52)

**9. Guided Practice:** Find the coordinates for the image of  $JKLM$  after the translation  $(x,y) \rightarrow (x-2,y+4)$ . Draw the image.



Refer to example 4 on page 52.

**10. Guided Practice:** Use the diagram in example 4 to write a rule for the translation of square 1 to square 3.

### 1.7 Assignment

(pp 53-55) 8, 10-12, 14, 18, 24, 26-29.

(p 59) 4, 6-8.

